Multiple Research Perspectives as a Paradigm to Co-create Meaningful Real-life Experiences

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ABSTRACT

"Multi-perspectivism as a philosophy of education" has a predominant role in the mission statement of Ghent University [1]. It opens up a path towards a critical and active participation into the society of today and the future. Within the framework of multi-perspectivism, a novel course has on "Co-creation" been set-up that is offered as an elective course in all educational programs of the university [2]. The course focuses on methods for creativity, transdisciplinary research, entrepreneurship, communication and collaboration, system thinking and design. The leading lecturers are members of the department of "Industrial Systems and Product Design" of the Faculty of Engineering and Architecture.

Students, researchers and lecturers from different faculties are actively participating in a transdisciplinary project to solve a real societal need. Each project brings all involved stakeholders – experts from different specialisms, designers and end-users – together in an iterative collaborative change process (using co-creation methods). Prototyping real-life experiences in a living space plays a central role as integration and communication method throughout the development cycle. During every iteration, a co-experience is obtained by all involved stakeholders through direct interaction with the prototype in a real "make" or "use" context. These interactions gradually reveal affordances and disturbances by iterative adaptations.

This particular education method is illustrated by ongoing student project cases in the domain of health-care and societal problems. An overview will be given on how to identify and set-up projects, how students perform these projects, and on how the obtained knowledge and results are valuated and transferred back to society.

Keywords: Multidisciplinary research, Multi-perspectivism, System design, Co-creation, Double-loop learning, Education.

1. INTRODUCTION

Multi-perspectivism as educational philosophy

"*Multi-perspectivism as a philosophy of education*" has a predominant role in the mission statement of Ghent University [1]. It opens up a path towards critical thinking, ethics and active participation into the society of today and the future.

According to this philosophy, students will learn more efficiently if they are allowed to discover more themselves and collaborate with their peers to solve problems. The role of the learning environment and the lecturer consists of offering challenges, providing information that can quickly be integrated, and encouraging analysis, reflection and synthesis. This is an ideal concept, which can be converted into a number of teaching techniques. The "creative knowledge development concept" of Ghent University translates this ideal concept into a more feasible one.

Developing *creative knowledge* is the core concept behind this education shift and is based on seven principles:

1. knowledge is the basis of creativity,
2. developing knowledge is a skill,
3. creativity requires a critical attitude towards one's (own) knowledge,
4. the unknown is a challenge rather than a threat,
5. communication generates knowledge,
6. creativity presupposes a lifelong development of knowledge,
7. diversity promotes creativity.

Project based course on "Co-creation"

Within the framework of multi-perspectivism, a novel course on "*Co-creation*" (6 ECTS[1] credits) has been set-up that is offered as an elective course in all educational programs of the university [2]. This course focuses on methods for creativity, transdisciplinary research, entrepreneurship, communication and collaboration, system thinking and design [3].

[1] ECTS: European Credit Transfer and Accumulation System for higher education

Students, researchers and lecturers from different faculties are actively participating in a transdisciplinary project to solve a real societal need. Each project brings all involved stakeholders – experts from different specialisms, designers and end-users – together in an iterative collaborative change process (using co-creation methods).

The leading lecturers are members of the department "Industrial Systems Engineering and Product Design" at the Faculty of Engineering and Architecture. The overall outline fits within the basic vision of this research group [4].

2. DESIGN PRINCIPLES ADOPTED IN THE CO-CREATION COURSE

The course outline is based on following basic design theories and methods:

System design

Design has, since its advent in the early 20th century, evolved from a product perspective (constructivism), to a "designerly" [5] process perspective (design thinking) and is now entering a new era that uses systemic design methods to solve complex societal "wicked problems" [6]. Dialectic design [7] unites Herbert Simon's science for the artificial and John Dewey's pragmatic view on design [8], which has led to a design thinking approach. Even this perspective is now blurring out when considering the design of sustainable and complex systems designed for interaction and evolution. Therefore, the design paradigm must be shifted towards a "purpose" driven system design perspective. Verganti [9] gives us insight into the world of what radical innovation (and change) means for society. He also indicates that we should avoid overabundance and rather focus on designing meaningful products [10].

The "system design" approach that is proposed and adopted by the Industrial Design Centre of Ghent University Campus Kortrijk is one focusing on purpose driven design by incremental and collaborative change [4,11]. It unites the dialectic of an abstract cybernetic design model [12] and a tangible realization (call it prototype) of the designed artifact. The intended and unintended uses of the design become gradually visible through a conversation [13] and interaction of the product in a living lab environment.

Active participation, critical thinking and acting from multiple research domains trigger change of perspectives during the whole co-creation process.

Research through design principle and experience prototyping

Multiple research disciplines and perspectives offer a multitude of scientific (abstract) models and languages that need to be shared and acknowledged. This process can only be obtained by integrating research disciplines into design using design principles as research through design [14], cybernetics and design [12], design for conversation [15] and experience prototyping [16].

This process of developing through multi-perspectivism can be compared with a situation in which people are conversing with each other using different languages (French, English, Hindi, Chinese). The misunderstanding and misuse can only be overcome if you can iteratively realize (design, prototype and observe) real life experiences.

Prototyping real-life experiences in a living space plays a central role as integration and communication method throughout the development cycle [17,18]. During every iteration, a co-experience is obtained by all involved stakeholders by directly interacting with the prototype in a real "make" or "use" context. These interactions gradually reveal affordances and disturbances by iterative adaptations.

The real-life experience can be obtained by simultaneously realizing (1) the product, (2) the activity of interaction and (3) its context of use. This is dialectically realized as a continuously updated cybernetic model (describing the abstract dynamic model) as well as through a threefold low-to-high fidelity prototype of the product, activity and context that is functioning as a living lab experiential playground.

Double loop learning

The above mentioned "*Research through Design*" principle is a double loop learning method. In the first iteration loop, the project is gradually enveloped towards a specific goal using adaptive strategies (designing). If the goal is not fitting with the expectations and requirements, a second order loop is formed in order to find the real goal using adapting strategies (research, reflection).

3. ORGANIZATION OF THE COURSE

This particular education method will be illustrated by ongoing student project cases in the domain of health-care and societal problems. An overview will be given on how to identify and set-up projects, how students perform these projects, what is the unique infrastructure, and on how the obtained knowledge and results are valuated and transferred back to society.

Educational infrastructure

In September 2017, Ghent university has officially opened "Ghent Design Factory" (http://www.ghentdesignfactory.be), a multidisciplinary, open environment for co-creation and design thinking. Ghent Design Factory bundles several initiatives / locations that share the Design Factory mindset. It is member of the Design Factory Global Network (https://dfgn.org) Design factories are platforms for experimentation, action and co-creation in close relation with industry and its surroundings.

Two locations / initiatives of Ghent design factory are involved in the organization of the co-creation course: "The Foundry" and the "Industrial Design Center" (Campus Kortrijk).

The Foundry, which started in 2016, (https://www.ugent.be/thefoundry/en) is an initiative and space to support creativity, innovation and entrepreneurship among the Ghent University community. This is an open community where students can work at any time on their multi-disciplinary projects

in a unique setting. It represents a very open and entrepreneurial workspace in the centre of Ghent city that is easy to access from all surrounding campuses.

The "Industrial Design Center" (IDC) is the open knowledge center of Howest University of Applied Sciences and Ghent University Campus Kortrijk where industry, research and education meet to co-create on a daily basis. IDC represents 25 years of experience in product design, innovation and creativity (http://www.industrialdesigncenter.be) and is directly linked to the design region of the city of Kortrijk. It has a very broad range of equipment for prototyping solutions, ranging from a manual prototyping workshop (wood, foam, cardboard, clay, ceramics), electronic prototyping, textile prototyping, makerspace and digital prototyping, plastics and composites prototyping.

Co-creation course outline

The course represents 6 ECTS credits and is organized as one-year-course (with a time span of two semesters or 10 months) in order to be able to tackle the complexity of the obtained goals.

The co-creation course is mainly organized into two very open educational settings: and multitude of open lectures and a societal project.

The lectures and workshops are organized around following topics:

1. Models for co-creation
2. Design Thinking, creativity and prototyping
3. Entrepreneurship
4. Communication
5. Human aspects of co-creation
6. Economic aspects of co-creation
7. Technological aspects of co-creation
8. Deontology

Lectures are given by a team of experts from four different faculties. For each subject, an introductory lecture is given followed by a debate with all involved disciplines. The final evaluation is performed by requesting the students to reflect on the offered insights by means of an essay.

Call for projects

Beginning of April, the Foundry does a "call for projects" towards all research groups and industrial partners that have a collaboration agreement with the university. All projects are screened upon their multi-perspectivism and applicability in a student context. All involved stakeholders are contacted and informed about the outline of the course. For the selected projects, a project definition outline is defined.

Special attention is paid towards the intellectual property rights. Since all projects are screened on their societal of health impact, all involved participants (students, research centers and companies) have to sign a contract in which they do not claim any individual property right but give the outcome back to the society in order to be able to continue the development.

Project kick-off

At the start of the academic year, a kick-off event is organized, where all participants (students, lecturers, researchers, users – patients – clients, companies and staff members of the university) are invited. All projects are presented in a pitch and afterwards all participants can meet personally.

The students who participate in the course must form multidisciplinary groups of at least three different disciplines and at least five students per team. In each team, at least one student in industrial design engineering technology must participate.

In the second week, all involved students and stakeholders have a kick-off meeting to define the project goals and aims as well as the personal goals and aims. Each team gets a personal coach that will follow them throughout the academic year.

Student participation and involvement of external stakeholders - coaching

The students and stakeholders meet on a regular basis (approx. every four weeks) in order to report on the progress of the project. Students make an on-line communication and documentation space that is shared with all stakeholders.

A number of coaching sessions is planned in the academic calendar. At that moment, the personal coach participates actively in the team-meeting and gives suggestions on improvements. The coach pays attention to: (1) development of a common language, (2) the process of co-creation and positive collaboration, (3) respecting deadlines, (4) targeting and defining challenging research goals, (5) criticism, (6) creativity and diversity of perspectives, (7) empathy, (8) deontology, (9) personal coaching.

At certain moments (three times a year), all groups must present their progress to a broader audience (with external jury and involved stakeholders).

Final deliverables

At the end the students must be able to communicate the achieved research results in the form of a common final report (publication), a poster and a presentation stand for a fair. In addition, each student must compile an essay on their perspective on "co-creation".

4. RESULTS

Case studies

In the academic year 2017-2018, there have been 6 projects selected and 35 students are participating from 11 educational programs and 4 faculties. In addition, 7 research groups of the university are participating in this "co-creation" project.

Here is a short overview of the ongoing projects in year 2017-2018:

1. Physical photo service to activate or improve the social network and communication with elderly in care homes
2. Use biomimicry as a sustainable solution for packaging

3. Effective use of AR / MR in sports
4. Re-use, re-appropriation or recycling of dedicated 'used' wheelchairs
5. Supportive clothing for people with Parkinson disease
6. Clothing to prevent/control lymphedema

State-of-progress

The most actual state-of-progress on these projects will be shown at the conference.

5. CONCLUSION AND FUTURE WORK

This open course on co-creation has started in 2017 and is now running for the second time. The course itself is a learning experience for the lecturers. The outcome of the course and feedback of the students will be used to improve the quality of organization and coaching.

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